



Figure 57-1: Location of MLRA 57 in Land Resource Region K.

57—Northern Minnesota Gray Drift

This area is entirely in north-central Minnesota (fig. 57-1). It makes up about 9,785 square miles (25,355 square kilometers). The towns of Bagley, Bemidji, Blackduck, Detroit Lakes, Grand Rapids, Mahanomen, Northhome, and Walker are in the northern part of this MLRA, and Albany, Sauk Centre, and Browerville are in the southern part. U.S. Highways 2, 10, 59, 71, and 169 cross the northern part, and Interstate 94 and U.S. Highway 71 cross the southern part. The northern part has a considerable acreage of State forestland and numerous lakes, including Leech Lake and Lake Winnibigoshish. It also includes parts of the Chippewa National Forest, the southern part of the Red Lake Indian Reservation, and most of the White Earth and Leech Lake Indian Reservations. Some of the Camp Riley Military Reservation is in the northeast corner of the southern part of this MLRA.

Physiography

This area is in the Western Lake Section of the Central Lowland Province of the Interior Plains. The landscape developed through a series of glaciations and subsequent retreating and wasting of the ice sheets. A complex pattern of moraines, outwash plains, drumlins, lake plains, and drainages characterizes the area. Lakes, ponds, and marshes are common. Elevation is about 985 to 1,640 feet (300 to 500 meters). On this choppy and complex landscape, relief typically is 15 to 50 feet (5 to 15 meters) within short distances.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows:

Mississippi Headwaters (0701), 67 percent; Red (0902), 22 percent; Rainy (0903), 10 percent; and Western Lake Superior (0401), 1 percent. This area is on a watershed divide in North America. Surface water in most of the northern and western parts of the area drains into the Red River of the North, eventually entering Hudson Bay. The rest of the area is drained by the Mississippi River, southward into the Gulf of Mexico. The headwaters of the Mississippi River are in the northern part of the area. The Mississippi River and its tributaries drain most of the area.

Geology

All of this area is covered by Wisconsin-age drift. The glacial deposits are from four major ice lobes—Des Moines, Rainy, Superior, and Wadena. The thickness of the glacial till ranges from 300 to 600 feet (90 to 185 meters). Some areas of these deposits are overlain by outwash or lacustrine sediments. Some depressional areas have an accumulation of organic matter. These organic deposits are more than 8 feet (2.5 meters) thick in some areas.

Climate

The average annual precipitation in this area is 23 to 29 inches (585 to 735 millimeters). About 65 percent of the annual precipitation falls as rain during the 5-month growing season (May through September), and about 18 percent falls as snow. The average annual temperature is 37 to 43 degrees F (3 to 6 degrees C). The freeze-free period averages 150 days and ranges from 120 to 175 days.

Water

Following are the estimated withdrawals of freshwater by use in this MLRA:

Public supply—surface water, 7.0%; ground water, 4.5%
 Livestock—surface water, 1.5%; ground water, 4.1%
 Irrigation—surface water, 7.8%; ground water, 28.1%
 Other—surface water, 46.9%; ground water, 0.0%

The total withdrawals average 64 million gallons per day (240 million liters per day). About 37 percent is from ground water sources, and 63 percent is from surface water sources. This area has abundant supplies of both surface and ground water that meet all of the current needs of the area. The surface water generally is of good quality, and its use is not limited. Many lakes provide ample opportunities for recreation.

Abundant supplies of good-quality ground water are in both surficial and buried drift aquifers throughout this area. Water from these aquifers is a calcium-magnesium-bicarbonate type that is hard. The median concentrations of total dissolved

solids are about 350 parts per million (milligrams per liter) in the surficial drift aquifer and 450 in the buried drift aquifer. Nitrate concentrations can approach the harmful limit of 10 parts per million (milligrams per liter) in the surficial drift aquifer. Glacial till generally caps the buried drift aquifer, which is thus more protected from contamination by surface activities than the surficial drift aquifer. The deeper aquifer, however, has very high levels of iron.

Soils

The dominant soil orders in this MLRA are Alfisols, Entisols, and Histosols. Some Mollisols are in the westernmost part of the area. The soils in the area have a frigid soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. They are very deep and generally are sandy to loamy. Their natural drainage class is related to landscape position. Endoaqualfs (Effie, Talmoon, and Willosippi series) formed in till on moraines. Epiaqualfs (Nokay, Paddock, and Watab series) and Glossudalfs (Blowers, Sol, and Steamboat series) formed in till on drumlins and moraines. Hapludalfs (Beltrami, Mahkonce, Naytahwaush, Nebish, Snellman, Sugarbush, Suomi, Two Inlets, and Waukon series) formed in till or outwash on moraines. Udipsamments (Eagleview, Graycalm, and Nymore series) formed in outwash on moraines. Haplosaprists (Cathro and Markey series) formed in organic material over outwash or till on moraines. Haplohemists (Rifle series) and Haplosaprists (Seelyeville series) formed in a thick layer of organic material on moraines.

Biological Resources

Prior to settlement, the vegetation in this area was mainly a mixture of deciduous trees and conifers. White pine and red pine grew on moraines. Jack pine was dominant on outwash plains and sandy lake plains. Red oak, sugar maple, and basswood grew in sheltered areas close to lakes. Forested lowlands were dominated by black spruce, tamarack, white cedar, and black ash. Wetlands that were not forested were dominated by sedge meadow communities. The western part of the area was dominated by tall prairie grasses. Most of this area is still forested. Aspen is the most common species both in pure stands and in mixed stands with birch, maple, oak, white spruce, and red pine.

Some of the major wildlife species in this area are white-tailed deer, black bear, ruffed grouse, and sharp-tailed grouse. Because of its relatively unaltered landscape, this MLRA supports a high percentage of the rare plants and animals that occur in Minnesota. These species include the bald eagle and the eastern timber wolf.

Land Use

Following are the various kinds of land use in this MLRA:

Cropland—private, 16%
Grassland—private, 8%; Federal, 1%
Forest—private, 51%; Federal, 8%
Urban development—private, 3%
Water—private, 8%
Other—private, 5%

About 25 percent of this area is in farms. The farms generally are small and are used mainly for forage and feed grain for livestock. Livestock operations are in scattered areas throughout the MLRA. Sunflowers, wheat, soybeans, and other cash crops are grown on some farms, mainly in the western part of the MLRA. Almost 60 percent of this area is forested. Part of the forestland is in State and national forests. Hardwood forest types make up most of the area. Aspen is the dominant species. It is used in chipboard and pulp production. Softwood species (fir, pine, and spruce) are used for pulp. This area has many lakes, ponds, and marshes, and water-based recreation and summer home development are significant economic enterprises.

The major resource concerns are poor soil drainage, which affects crop production; poor grazing management in areas of forestland and grassland; water erosion and wind erosion; and water quality. Conservation practices on cropland generally include crop residue management and conservation crop rotations, both of which help to control water erosion and wind erosion. Drainage ditches are used to improve drainage. Filter strips are installed along drainage ditches and streams to preserve water quality. Prescribed grazing systems are used to improve grazing management and remove livestock from forested areas. Exclusion from use as needed, forest stand improvement, riparian forest buffers, and proper establishment of trees and shrubs restore damaged forests and improve water quality. Field windbreaks reduce the hazard of wind erosion and improve crop production. ■